

The Devil is in the Data

How Data Can Save The Oil and Gas Industry



The total volume of data created, captured, copied, and consumed in the world is staggering, and grows exponentially each year. Each day across the globe we generate [2.5 quintillion bytes of data](#), a number so unfathomably large it quickly loses all meaning. In our own industry, at the height of activity in 2018, the US onshore drilling industry alone was responsible for over a petabyte of data creation daily.

But, if we look past the immediate overwhelming nature of such large volumes of data, there lies opportunity. Suppressed demand and uncertain growth forecasts brought on by the Covid-19 pandemic further damaged an already fragile energy industry. Price-wars, challenges replacing lost production and funding uncertainties have led the entire industry to re-evaluate its position in the world and seek innovative ways to power future growth. Innovation which is fuelled by data.

Challenges For 2020 and Beyond

In order to maintain growth in future years, the oil and gas industry faces a sizeable challenge to find innovative solutions that maximize productivity while battling rising costs and promoting long term business sustainability. Although inherently complex the keys to success for an operator could broadly be grouped as:

- **Managing Costs** – providing a sustainable business model to drive future growth
- **Maintaining and Growing Production** – ensuring that market share is at the least maintained
- **Providing Sustainability** – building a business that can weather uncertainty and market price fluctuations

All three of these key points require planning and alignment across the entire organization to be successful. But, how best to balance the requirements of conducting business today with a need to plan for the future?

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The primary role of exploration and production departments is to maintain a healthy reserves inventory and to provide cost-effective exploration and production methods.

Mature fields around the world are reaching the end of their lifecycle and undergoing decommission. Many still active fields are moving to more marginal areas of pay, struggling to replace declining production rates as 'sweet spots' are expended.

In order to replace the decline in production, companies are placing increased importance on understanding the subsurface, identifying prime exploration opportunities and aiding in creating more effective production strategies. Scientific workflows enable us to generate this subsurface insight but in order to create these workflows the industry needs to utilize the other asset that it has in droves – data.

Subsurface data ranging in scale from seismic, to well logs, down to individual rock and fluid measurements have been acquired for roughly 100 years. In that time, the amount and variety of data acquired has increased exponentially.

However, as the volumes of data acquired increase, the methodologies and tools to manage and utilize that information have not evolved at the same pace, leading to a situation today where many organizations are drowning in their data archives.

[Gartner](#) calls data and analytics “the key accelerant of an organization’s digitization and transformation efforts,” saying that a company’s ability to compete in the emerging digital economy will require faster-paced, forward-looking decisions.

This is much easier said than done. For something so key to our understanding of the subsurface – why, as an industry, do we not improve the handling of our data?

The Data Situation Today

In an average oil and gas operator, data can be split into two large pots - data which is utilized, and that which is not. And with any operator, there are viable and logical reasons for why that split exists - ultimately controlled by the realized value of that data.

Value of Data – Potential vs Realized

The value of data to an organization is tied directly to the relevance of that information to solve particularly business challenges. Until this data is utilized then that value is only potential data value.

However, that potential value can only be converted to realized value if the data is handled in a way which allows users to apply that information directly to the challenges they seek to overcome.



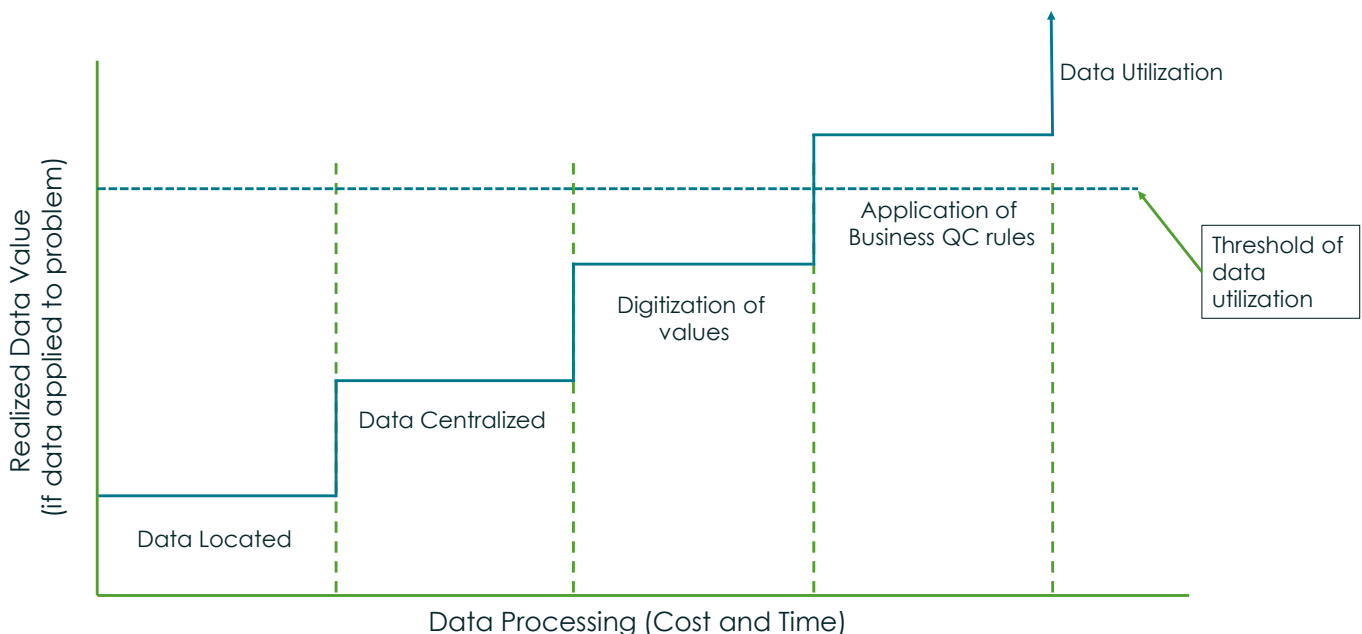
Data has potential value that can only be realized once that data is applied to the problem. The amount of effort and realized value of that data is product of how that data is managed in the operator

If data cannot be utilized then its realized value to the organization is zero. Even data which can be utilized may have its realized value limited by the way it is handled in the organization (for example the comparison between loading digital values into a model vs qualitative appraisal of a PDF well log).

The difference between potential and realized data value can be closed by improved management practices – promoting data accessibility, trust and interaction for the end user.

However, the time and cost to implement these management practices for a given piece of data may be deemed by the user to be more than they are willing to spend to allow utilization of this data. For any given workflow, data needs to be of a certain standard to be utilized. If the effort to elevate the quality of this data is deemed too high, then the data is likely to be discarded entirely.

If we can limit the cost, effort and duplication of these data management processes we can increase data utilization and maximize the realized value of that data for our end users - ultimately improving our understanding of the subsurface.



Data processing events can improve realized data value this increasing the likelihood of utilization. However, these events also take time and resources. A key challenge of data management is formulation of processes that can reduce the cost of these quality improvements.

Why Do We Have This Situation?

In a perfect world, all data would be stored in a manner that enables our subsurface teams to immediately access the information, understand its relevancy and instantly utilize it in technical workflows. Put simply, our realized data value would be the same as the potential data value.

Unfortunately, due to budget and resource limitations, for much of the industry that scenario is a long way from being realized.

Traditionally, data management has been a huge drain financially on any Information Technology department. A [recent paper](#) by McKinsey & Co. Digital suggests that globally, businesses can expect to spend over 50% of their IT budget on managing data, and that is expected to grow by almost another 50% in the next 3 years.

However, the same paper also suggests that those companies who invest in upgrading data management processes and infrastructure could expect to reduce those costs by 150%, with half of that potentially being realized in the first 6 months of deployment. How? Through increased efficiency delivered by automation, defined corporate procedures and improved process governance.

Turning Cost to Profit

The savings from more efficient processes and improved management are clear, but so are the potential benefits and drive to the rest of the organization. By providing unrestricted access to decades of legacy data, new value adding workflows are possible, effectively turning IT departments from a cost center to a profit generator.

Data centric workflows such as those utilizing machine learning to crunch through massive volumes of data can redefine how the industry approaches exploration and production. Identifying previously missed zones of pay or accurately predicting and planning for negative drilling events before they occur both have the potential to free up millions in CAPEX budget and dramatically increase ROI. These workflows will, however, require large amounts of conditioned and accessible data to add value, and that in-turn requires contemporary and efficient data management methods.

The Human Data Stores

The greatest resource in any industry are the people – they are key to growing our businesses through intelligent appraisal of information, insightful decision making and creating productive environments and cultures. In all our jobs, we are constantly analyzing thousands of data points to feed a continuous decision making process taking place individually in our own brains. We build layers of ambient knowledge which may have critical business value, but if the processes and tools don't exist to allow this knowledge to be documented and shared, we risk losing it all as our employees move around and through our organizations.

And it's not just knowledge – [almost 70% of employees take sensitive data with them when they leave an organization](#). Without data governance and security protocols, organizations have no control over how and what data departs their offices, a problem exacerbated as the COVID-19 pandemic forces remote working conditions and fluidity of staffing levels throughout the recent downturn.

Defining a Transformation Strategy

Providing aggregation, quality control and accessibility to data falls typically under the remit of data management departments. However, the process of designing new workflows to achieve this, alongside the provision of tools to generate new value from this data, should be thought of as key goals of a cross-organization digital transformation project.

But if the goals are easily defined, delivering the solutions that meet them is not. Some [70% of transformations are deemed a failure](#), largely due to internal barriers to transformation which exist within the organization such as:

- **Cost** – projects without a clearly defined scope have the potential to become costly and out of control. A clear business purpose and requirements must be drawn up prior to engagement and the original scope must be revisited frequently to ensure the core requirements are being met.
- **Resources** – personnel must be made available to action and achieve the projects aims regardless of the size and scale of project. In the current industry where headcount costs are scrutinized, finding dedicated resources is not always an achievable task.
- **Skills** – many of the skills necessary to manage such a transformation project are frequently not contained within an existing subsurface department. The addition of data solutions architects or transformation managers can assist with this scoping, but the cost to hiring individuals with this skillset can be prohibitive.
- **Culture** – data culture describes the mannerisms in how individuals treat data in an organization, and like all cultures, this is strongly influenced by the environment. For example, organizations where data access and quality are poorly managed at a corporate level will frequently create a culture of data hoarding, where individuals and assets store the information they need to perform their workflows in their own disconnected environments. Such behavior is to the detriment of wider corporate data initiatives and also decreases efficiency of data access amongst interrelated departments. Ensuring buy-in across all areas of the business to build 'a better way' is vital for the success of these transformation projects.

Breaking Down Barriers – How Ikon Science Can Help

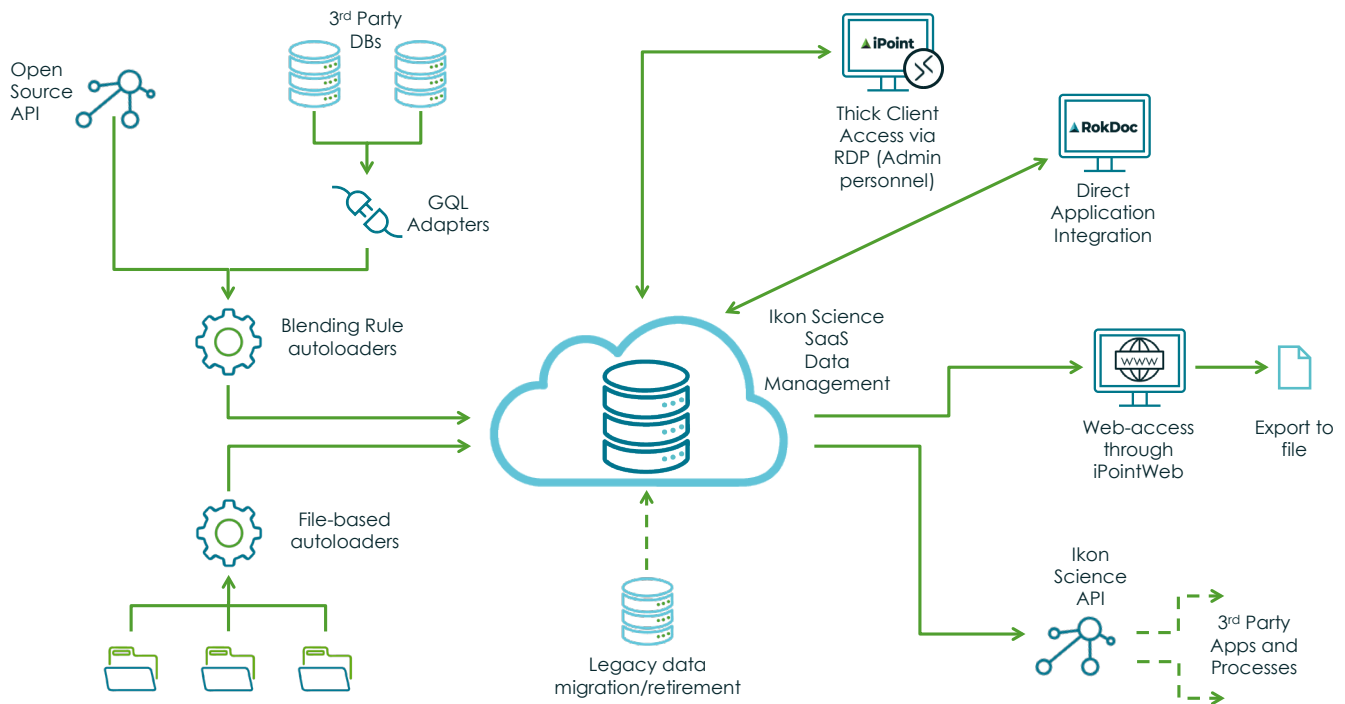
[Digital-first enterprises deliver 8x revenue growth and 2x profit margin compared with competitors in their respective fields.](#)

Are you ready to accelerate your business?

Ultimately the drive for transformation needs to come from the organization itself, either through a desire to reduce costs, increase efficiency or drive innovation. But once that seed is planted, having an experienced partner to deliver the solution can help navigate many of the barriers identified above.

Introducing Ikon Science Data Solutions

Ikon Science Data Solutions partners with organizations so they can utilize our expertise and experience in both data and subsurface workflows to create fit for purpose digital transformation. We can help you rise to the challenge of a faster moving world and prepare for the future. We provide the people, processes and tools to help you every step of the way with a multi-faceted offering providing guidance and management as well as industry leading technology and software to deliver solutions to match your own organizations unique challenges.



Example of Ikon Science delivered data management solutions

Software - One Access Point of Truth For Your Data

The iPoint software is a dedicated data management and visualization platform, designed to provide high quality data directly into the end-user's workflow. Each client has different challenges and requirements and by utilizing our commercial, but configurable, data platform we can deliver a solution that is customized for your needs. Intuitive search and visualization tools communicate confidence and additional accessibility can be added for end users through an optional web interface.

Automation and Integration - Democratization of Data and Analytics

A powerful software is nothing without high quality data. Our automated loading and integration workflows ensure quick and simple population of the iPoint system as well as confirm instant distribution throughout your subsurface data ecosystem. Configurable business rules are set up to be applied automatically on data load, speeding the process while increasing data quality, while our API and data-table views allow data to be transferred directly into value added workflows no matter the software package.

Consultancy and Delivery - Extending Your Workforce

Digital transformation strategies [rarely fail due to technology](#), but due to sub-optimal scoping and implementation processes. We'll take our 20 years of expertise in completing more than 1,300 projects around the world to help you achieve your results.

From the beginning, our methodology helps you to create business-focused deliverables, assist with cross-organizational buy-in and manage implementation and deployment. The 8-step Ikon Science Implementation plan provides a clear framework

which can then be adapted on a project-by-project basis to ensure fit for purpose deliverables.

Embarking on a digital transformation project can be an overwhelming and daunting process, but if managed correctly, it can provide a platform for innovation that can power the continued growth of our industry through this challenging environment. Is now the time for you to learn more about how to get your business and technology prepared and aligned for this important shift? We are standing by to help. For more information on how Ikon Science can assist, please click [here](#).